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Application of cell and tissue cultures for potential anti-cancer/oncology drugs screening in vitro

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Abstract

One of the reasons for the failure of potential anticancer drugs in clinical trials is the imperfection of existing preclinical screening systems. Perhaps the most important step is in vitro testing during which several substances with certain properties should be selected from a large number of substances. An effective system of screening should closely resemble the organization of naturally occurring tumors. Cell cultures are the most simple from technical point of view in vitro models of tumors. However, in many respects cell cultures different from natural tumors. Several models which are more accurately (compared to simple monolayer cultures) emulate the tumor and its microenvironment are developed. An example is three-dimensional cultures. Furthermore, additional methods of anticancer drugs testing are developed based on tissue slice cultures. This review describes current in vitro models which can be used to test the activity of potential drugs for use in treating of oncological diseases.

Keywords

Cell culture, Screening of anticancer drugs, Three-dimensional model of cell cultures